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US EPA RECORDS CENTER REGION 5



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September 11, 1996

Reference No. 3481

Ms. Sheri Bianchin
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY (USEPA)
Region V (HSRL-6J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Dear Ms. Bianchin:

Re: Wetland Sediment Sampling Plan
American Chemical Service

Please find enclosed a plan to collect additional wetland sediment samples. We recognize that USEPA has not yet commented on the Wetland Technical Memorandum. This plan has been submitted in order to allow Montgomery Watson the opportunity to collect samples prior to winter.

Sincerely,

CONESTOGA-ROVERS & ASSOCIATES

Ronald Frehner

RF/br

Enc.

c.c. Holly Grejda; IDEM
Steve Mrkvicka; Black & Veatch
ACS Technical Committee

PRE-DESIGN WORK PLAN ADDENDUM

PHASE II WETLANDS SEDIMENT SAMPLING

1.0 BACKGROUND

In May of 1996, a supplemental wetlands investigation was conducted in the wetlands north and west of the ACS facility in accordance with U.S. EPA approval. The sampling program consisted of collecting sediment samples at 22 locations and surface water samples at 12 locations. The purpose of the sampling was to further define the extent of certain compounds in the wetland that had been identified during the Remedial Investigation. The sampling was planned to provide data to evaluate whether impacts from the ACS site might occur through groundwater discharge to surface water, or direct runoff from ACS plant site process areas.

2.0 PHASE I SAMPLING RESULTS AND CONCLUSIONS

The Phase I sampling results indicated that VOCs, SVOCs, PCBs, and metals had migrated into the wetland area. However, most of the compounds were detected at relatively low concentrations with apparently random distribution. VOCs were detected in only two surface water samples, both related to the groundwater seep discussed below. Based on the Phase I sampling, the following generalizations can be made regarding the overall impacts to sediments.

- VOCs were detected in many of the sediment samples, but concentrations, except for the groundwater seep area, were below 250 ug/kg for acetone, and below 100 ug/kg for other compounds including chloroethane, methylene chloride, 1,2,-dichloroethene, 2-butanone, and toluene.
- A number of SVOCs were detected in the sediment samples, but the total SVOC concentrations for any sample were less than 5,000 ug/kg (5 mg/kg). Three sediment samples contained higher concentrations of SVOCs. Total SVOCs were approximately 15 mg/kg in SD22, 8 mg/kg SD25, and 6 mg/kg in SD38.
- PCBs were detected in 19 of the 22 sediment samples. Except for the three locations discussed below (SD21, SD33, and SD35), the total PCB concentrations ranged from less than 1 mg/kg to approximately 6 mg/kg.
- Metals were found in all the sediment samples (as would be expected since metals are detectable at background levels), but the concentration ranges for each metal were generally within a single order of magnitude. The sample from SD33 had higher metals concentrations, and that location is discussed below.

See the July 25, 1996 Wetland Investigation Technical Memorandum for more detail regarding the results of the Phase I sampling.

Two areas of impact to the wetland were identified by the May 1996 sampling: a groundwater seep containing elevated benzene concentrations, and several samples with elevated PCB concentrations. These are discussed further below.

2.1 BENZENE IMPACT

A groundwater seep area was identified north of the ACS Site, where both seeping water and the adjacent sediment contained elevated concentrations of benzene. A sample of the seeping water contained 1,800 ug/L of benzene, and a sample of the adjacent soil and sediment contained 11,000 ug/kg of benzene. In the recommendations section of the Technical Memorandum dated July 25, 1996, we proposed to place approximately one foot of low permeability soil over the seep, covering the discharge point and extending to the edge of the ditch into which it is draining. The seep area would be monitored weekly until the PGCS is operational and the extraction trench has lowered the water table in the vicinity. Any reappearance of the seep would be re-covered with low permeability soil.

2.2 PCB IMPACT

The second area of impact consisted of the drainage channel extending through the wetland from the western boundary of the ACS facility. Three sediment samples (SD21, SD33, and SD35) collected along this drainage channel were found to contain PCBs at concentrations above the 10 mg/kg cleanup objective for soils specified in the Record of Decision (ROD) for the site. (We understand that the soil clean up levels for the site are not directly applicable to the evaluation of sediments. However, since the ROD does not address sediment cleanup concentrations, the soil criteria of 10 ug/kg is being used herein to provide a qualitative evaluation of PCB levels and to focus the further investigation of PCB concentration and extent.)

<u>Sample ID</u>	<u>Total PCBs</u>
SD21	13.1 mg/kg
SD35	17 mg/kg
SD33	125 mg/kg

The distance from SD21 to SD33 is approximately 500 feet. Three other samples, SD31, SD34, and SD18 were collected along the same general channel, but showed lower PCB concentrations.

<u>Sample ID</u>	<u>Total PCBs</u>
SD31	0.9 mg/kg
SD34	0.027 mg/kg
SD18	below detection limit

An aerial photograph from 1980 (Figure 1) indicates that the channel within the wetland, cuts from near the ACS facility fence (Sediment Sample Location SD22) west into the wetland to its intersection with a north-south drainage ditch in the wetland in the vicinity of surface water sampling location SW12. The channel was identified in the field during the Phase I sampling at several locations. While PCBs are not currently handled or stored on site, it appears that in the past, surface water runoff from the site flowed along this channel. This water may have transported PCBs or sediments containing PCBs.

Further investigation is needed to better determine what PCB concentrations are representative of the wetland sediments, and to refine the definition of the total area of the wetland that is impacted by PCB concentrations greater than 10 mg/kg. A second phase of wetland sampling for PCBs is proposed herein to accomplish these goals. The need to conduct bioaccumulation studies can then be evaluated. The following section describes the sampling strategy and methods to develop the data for the evaluation.

3.0 PROPOSED PHASE II SEDIMENT SAMPLING AND ANALYSIS

Phase II wetland sediment sampling is scheduled to occur in late October or early November, 1996 (assuming U.S. EPA approval of this plan). At this time of year, the wetlands vegetation will have died back, permitting positive identification of the topographic expression of the drainage ditch and allowing sample collection unhindered by thick vegetation. The investigation will be conducted in three steps: 1) a field reconnaissance to identify and mark the location of the surface water runoff channel(s); 2) a field program to collect a relatively large number of samples in a series of transects along the drainage channel and grid system surrounding the area of the highest PCB concentrations detected in the May 1996 sampling; and 3), a phased analytical program to selectively analyze as many samples as necessary to complete the identification of sediment areas with PCB concentrations above 10 mg/kg

3.1 FIELD RECONNAISSANCE

The surface runoff channel will be identified in the field and marked with flagged stakes. Preliminary identification of the drainage channel will be developed from aerial photographs. The linear patterns in the wetland west of the ACS site (Figure 1) provide the initial location and orientation of the channel. The drainage ditch and primary flow channels will be identified in the field by topographic expression and water flow, if present.

3.2 SAMPLE COLLECTION

Two specific sampling patterns have been developed for the wetland area: 1) Sampling transects along the axis of the historic drainage channel and 2), a sampling grid surrounding sampling location SD33, where the highest PCB concentrations were identified in the Phase I sampling.

3.2.1 Sampling Transects Along the Historic Drainage Channel

Four proposed transects are shown on Figure 2. Three of the transects (T1, T2, and T3) have been selected to be perpendicular to the flow of the channel. One transect (T4) is arrayed around Phase I sampling location SD21. Samples will be collected at 25 foot intervals along each transect. At each sample point along a transect, samples will be collected from three depth intervals (i.e., 0 - 6 inch, 6 - 12 inch, and 12 - 18 inch). Actual sample locations will be determined in the field, with concurrence of representatives from U.S. EPA and IDEM. The sediment samples will be collected according to Montgomery Watson's sediment sampling Standard Operation Procedure (SOP) (see Attachment 1). The samples will be sent to the laboratory and held for analysis to be determined as described in Section 3.3.

A total of 20 sampling locations with 60 total samples (3 from each location) are represented by the transect locations. Each sampling location will be established with 0.1 foot horizontal reference by a surveyor.

3.2.2 Sampling Grid Surrounding Location SD33

Sediment sample SD33 from the Phase I investigation indicates the highest concentration of PCBs approximately 1,000 feet west of the ACS facility along the historic drainage channel. Figure 2 shows the proposed grid of sampling locations surrounding location SD33, and extending along the east-west oriented drainage ditch to the north-south oriented drainage ditch. Samples will be collected at the intersections of a 50 foot grid oriented along the east-west ditch. At each sample point along a transect, samples will be collected from three depth intervals (i.e., 0 - 6 inch, 6 - 12 inch, and 12 - 18 inch). Actual sample locations will be pre-determined in the field, with concurrence of representatives from U.S. EPA and IDEM. The sediment samples will be collected according to Montgomery Watson's sediment sampling Standard Operation Procedure (SOP), which was approved for the Phase I sediment sampling in May 1996.

A total of 46 sampling locations, with 138 total sample collections are represented by the grid intersection locations. Each sampling location will be established with 0.1 foot horizontal reference by a surveyor.

3.3 PHASED SAMPLE ANALYSIS

It is anticipated that the sample collection will deliver many more samples than will need to be analyzed to complete the identification of the extent of PCBs. The general approach will be to select a subset of the sampling locations representing the most likely impacted areas and submit these for laboratory analysis of PCBs. On the basis of the results of these analyses, a second set of samples, if necessary, will be selected to refine the definition of contaminated sediment. Additional subsets of samples would be selected as necessary to define the total extent of PCB concentrations above 10 mg/kg.

The samples submitted to the laboratory will be analyzed for PCBs at Level IV DQO using the CLP Statement of Work according to the approved SOP and QAPP that was used to collect and analyze the sediment samples in May 1996.

3.3.1 Channel Transects

Figure 3 shows the sampling grid and transect lines. For transects T1 and T2, the first round of laboratory analysis will be conducted on the 0 - 6 inch depth sample from the three central samples at each transect. Both transects T3 and T4 are arrayed around a Phase I sampling location that had PCB concentrations above 10 mg/kg. Therefore, the sample for the central point will be selected from the 6 - 12 inch depth and the one sample on each side of the central point will be selected from the 0 - 6 inch depth. Following this selection process, the first round of laboratory analyses will contain 12 samples from the four transects, analyzed for PCBs. The locations are shown on Figure 3.

If the three sediment samples analyzed for transect T1 or T2 indicate total PCB concentrations less than 10 mg/kg, no additional sediment samples will be analyzed along the transect. If one of the two outer sediment samples along the transect are greater than 10 mg/kg, then the next surficial sediment sample further out along the transect will be analyzed in the second round of analyses. In addition, at those locations where the surficial sediment PCB concentrations exceed 10 mg/kg, the next deeper sediment sample will be submitted to the laboratory for PCB analysis. If the central sample indicates PCB concentrations above 10 mg/kg, the next deeper sample from the location will be submitted for laboratory analysis. The process of submitting samples for analysis will be an iterative process, and will be complete when no samples analyzed within a batch exceed the 10 mg/kg criteria, or the samples collected along the transect are depleted.

3.3.2 Sampling Grid

The sampling grid surrounding SD33 provides 46 intersections. One intersection was sampled in Phase I (SD33). Seven additional locations have been selected and a total of eight samples will be submitted for the first round of laboratory analyses (Figure 3). For the first round of analyses, the sample from the 6 - 12 inch depth at SD33 location and the sediment samples from the 0 - 6 inch depth for each of the other seven locations will be submitted for laboratory analysis.

Second round samples will be selected on the basis of the results of the first round analyses. For any of the locations sampled from the 0 - 6 inch depth that show total PCB concentrations greater than 10 mg/kg, a second set of samples will be submitted for laboratory analysis. The second set will consist of the next four samples located 50 feet in each direction outward, and the sample from the 6 - 12 inch depth below the sample location that exceeds 10 mg/kg. The process will be iterative, continuing deeper and outward, until the analytical results are less than 10 mg/kg, or until the collected samples are depleted.

If the collected samples are depleted either laterally or at depth during the analysis, a third phase of sampling may be developed and submitted to the U.S. EPA for review and approval.

4.0 DATA ANALYSIS

The field and laboratory results will be reported in a Technical Memorandum. The Technical Memorandum will include a tabulation of the coordinates of the sample collection locations and of the analytical results. The narrative will describe the field investigation procedure and the rationale for sample selection. The figures will include a map of the surface water drainage channel, the sediment sample collection locations, and the PCB concentrations indicated by laboratory analysis. Calculations will be included for the areas with PCB concentrations above 10 mg/kg, and the potential volume of sediment with PCBs greater than 10 mg/kg. These will be used to make a recommendation regarding toxicity testing and bioaccumulation studies.

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This document has been developed for a specific application and may not be used without the written approval of Montgomery Watson.

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Graphic Standards CCM
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9-10-96

Technical Review
Project Manager

Management Review
Other



SCALE IN FEET

NOTES

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH PROVIDED BY THE NORTHWESTERN INDIANA REGIONAL PLANNING COMMISSION, DATED 1980.

FIGURE 1

Developed By	PV	Drawn By	CCM
Approved By	PSV	Date	9/12/96
Reference			
Revisions			

AERIAL PHOTOGRAPH OF WETLAND

AMERICAN CHEMICAL SERVICE
NPL SITE
GRIFFITH, INDIANA

Drawing Number
4077.0076

A1

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WATSON**

